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olus is intimately connected with the nuclear reticulum; that it contains nearly all the chromatin of the nucleus; that this is transferred, previous to division, into the nuclear thread, which is then segmented into chromosomes; and that in the reconstitution of the daughter-nuclei, the chromosomes become fused into a number of more or less spherical or irregular masses which unite to form the daughter nucleoli."

NUMBER OF POLLEN GRAINS IN INDIAN CORN.

In the *American Naturalist* for December, 1881, the writer published a note giving the results of a large number of careful counts and estimates made a few years earlier as to the number of pollen grains produced by Indian corn (maize). Briefly, the results were as follows: Average number of stamens in a 'tassel,' 7,200; average number of pollen grains in an anther, 2,500; average number of pollen grains produced by a plant, 18,000,000.

A recent bulletin (No. 77) prepared by Professor P. G. Holden, of the Iowa Experiment Station, gives considerably higher results, the statement being that "careful counts made at this station last year of the number of pollen grains found in an ordinary anther taken from different parts of a great many tassels showed that between 49,000,000 and 50,000,000 pollen grains were borne on an average by each tassel."

THE EARLY FALLING OF BOX-ELDER LEAVES.

EVERY one who has watched the box-elder tree (*Acer negundo*) carefully has noticed that the first leaves to appear in the spring are by no means typical, often being simple, but deeply cleft, so as to resemble those of the maples, and never having more than three leaflets when compound. These cataphyllary leaves occur on the first and second nodes of the shoots of the season, and even on the third and fourth in extreme cases, gradually approaching the typical five-foliate compound leaves. Within a fortnight of the appearance of the first leaves, and shortly after the typical leaves have developed the cataphylla begin falling from the trees. When this defoliation is at

its maximum the ground under large trees is covered with the discarded leaves, much as in the autumn. This is so marked that it is one of the objections to this tree on lawns and well-kept grounds. Why these leaves are discarded so soon is not plain. We are reminded of the discarding of the primary leaves of the pines, where the matter has gone so far that none of the first crop of leaves are retained. The streets of Lincoln, Nebr., which have many box-elder trees planted along their sides, are now (May 21) littered with these fallen cataphyllary leaves.

PHILIPPINE PLANT NAMES.

ON request of Captain G. P. Ahern, Chief of the Forestry Bureau of the Philippine Islands, the botanist of the bureau, Mr. Elmer D. Merrill, has prepared a very useful 'Dictionary of the Plant Names of the Philippine Islands,' which has been published at Manila by the Department of the Interior of the Islands. It consists of two parts, the first of which is an alphabetical list of the native names with the corresponding scientific names, while the second list includes an alphabetical arrangement of the genera and species, with native synonyms and short explanatory or descriptive notes. The extent of the undertaking may be inferred from the fact that between 4,500 and 5,000 native names are enumerated. And yet the author himself calls attention to the fact that the present enumeration records the native names for 'perhaps twelve to fifteen of the seventy or eighty dialects spoken in the archipelago.' There is evidently much more work of this kind to be done, and Mr. Merrill is entitled to much credit for the excellence of his list as far as he has carried it.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

EXPEDITION FOR SOLAR RESEARCH.

WITH the aid of a grant of \$10,000 from the Carnegie Institution, for use during the current year, the Yerkes Observatory of the University of Chicago has sent an expedition to Mt. Wilson (5,886 feet) near Pasadena, California, for the purpose of making special in-

vestigations of the sun. The principal instrument to be erected on the mountain is the Snow horizontal telescope, recently constructed in the instrument and optical shops of the Yerkes Observatory as the result of a gift from Miss Helen Snow, of Chicago. This telescope is a cœlostator reflector, the cœlostator mirror having a diameter of 30 inches. A second plane mirror, 24 inches in diameter, reflects the beam north from the cœlostator to either one of two concave mirrors, each of 24 inch aperture. One of these concave mirrors, of about 60 feet focal length, is to be used in conjunction with a solar spectrograph of 5 inches aperture and 13 feet focal length; a spectroheliograph of 7 inches aperture, resembling the Rumford spectroheliograph of the Yerkes Observatory; and a stellar spectrograph provided with a large concave grating, and mounted in a constant temperature laboratory. It is hoped that it will be possible with this stellar spectrograph to photograph the spectra of a few of the brightest stars. For fainter stars, the spectrograph is to be provided with several prisms, for use singly or in combination.

The second concave mirror of the cœlostator reflector is designed to give a large focal image of the sun, especially adapted for investigations with a powerful spectroheliograph and for spectroscopic studies of sun-spots and other solar phenomena. The focal length of this mirror is about 145 feet, so that it will give a solar image about 16 inches in diameter. The spectroheliograph for use with this large solar image is to be of 7 inches aperture and 30 feet focal length. For the present, until a suitable grating can be obtained, the dispersive train of this instrument will consist of three prisms of 45° refracting angle, used in conjunction with a plane mirror, so as to give a total deviation of 180°. The motion of the solar image, of which a zone about 4 inches wide can be photographed with the spectroheliograph, will be produced by rotating the concave mirror about a vertical axis by means of a driving clock. A second driving clock, so controlled as to be synchronous with the first, will cause the photographic plate to move behind the second slit. Three slits will be

provided at this point, so as to permit photographs to be taken simultaneously through as many different lines of the spectra. It is hoped that this spectroheliograph will prove to be well suited for use with some of the narrower dark lines of the solar spectrum.

The work of the expedition is under the immediate direction of Professor George E. Hale, director of the Yerkes Observatory. During his absence Professor E. B. Frost will be in immediate charge of the Yerkes Observatory, with the title of acting director. Professor Frost will also be the managing editor of the *Astrophysical Journal*. Mr. Ferdinand Ellerman and Mr. Walter S. Adams will be associated with Professor Hale in the work on Mt. Wilson.

Professor G. W. Ritchey, superintendent of instrument construction at the Yerkes Observatory, will be in charge of an instrument shop which is being fitted up for the expedition of Pasadena.

CARNEGIE INSTITUTION OF WASHINGTON.

ON May 18, 1904, the trustees of the Carnegie Institution met, and after transacting the necessary business to provide for the transfer of all matters to the Carnegie Institution of Washington, a charter for which passed congress and was approved April 28, 1904, adjourned without day. The trustees named in the act met at once and reorganized under the new charter. The by-laws of the Carnegie Institution were adopted as the by-laws of the new organization, and the officers of the old organization were elected. General resolutions adopting all the obligations, etc., of the old institution were passed. Under the new charter no questions can be raised as to the competency of the institution to carry on the operations outlined in the deed of gift of the founder.

The executive committee of the Carnegie Institution of Washington met after the reorganization and practically completed the making of grants for the year 1904. It will greatly facilitate the work of the executive committee if all those thinking of making applications for grants for 1905 will have them in in September, as applications for grants for 1905 will then be taken up.